REMARKS

The Office Action dated April 14, 2008 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 19 and 20 have been amended to more particularly point out and distinctly claim the subject matter of the invention. Claim 2 was previously cancelled. No new matter has been added. Therefore, claims 1 and 3-25 are currently pending in the application and are respectfully submitted for consideration.

The Office Action rejected claims 1, 3-19, and 22-25 under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious over Larsson, *et al.* (U.S. Patent No. 6,282,427) ("Larsson") in view of Heinonen, *et al.* (U.S. Patent Publication No. 2003/0069027) ("Heinonen"). The Office Action took the position that Larsson discloses all the elements of the claims with the exception of "past measurement," "and wherein the providing selection information comprises self-learning based upon historical quality information associated with the measurement devices," with respect to claims 1, 7, 12, 16, 22, and 24-25; and "the selection information including information of measurement devices that have historically provided measurement information," with respect to claims 6 and 23. The Office Action then cited Heinonen as allegedly curing the deficiencies of Larsson. The rejection is respectfully traversed for at least the following reasons.

Claim 1, upon which claims 3-5 are dependent, recites a method, which includes providing quality information regarding quality of results of past measurements

associated with location determination by at least two measurement devices. The method further includes storing said quality information and identity information associated with the at least two measurement devices. The method further includes providing selection information for selection of measurement devices for future location determinations, based upon the stored quality and identity information. The providing selection information includes self-learning based upon historical quality information associated with the measurement devices.

Claim 6 recites a method, which includes triggering a location process, and obtaining selection information for selection of at least one measurement device, the selection information including information of measurement devices that have historically provided measurement information that satisfies a predefined criteria. The method further includes selecting at least one measurement device, and locating user equipment based on measurement information from the selected at least one measurement device.

Claim 7, upon which claims 8-11 are dependent, recites a method, which includes storing historical data of various measurements in a mobile system. The method further includes selecting at least one measurement device based upon the historical data. The method further includes self-learning based upon historical data associated with measurement devices.

Claim 12, upon which claims 13-15 are dependent, recites a system, which includes at least two measurement devices configured to provide measurement data for

location determination, and a quality controller configured to provide quality information regarding quality of results of past measurements by the at least two measurement devices. The system further includes a storage configured to store quality information of measurements by the at least two measurement devices, and a selection controller configured to provide selection information for selection of measurement devices for future location determinations based upon quality information that is stored in the storage. The system is configured to self-learn based upon the quality information regarding the quality of results of past measurements by the at least two measurement devices.

Claim 16, upon which claims 17-20 are dependent, recites an apparatus, which includes a processor configured to process quality information associated with quality of results of past location measurements by a plurality of measurement devices and to provide selection information for selection of at least one measurement device for future location determinations based upon the quality information. The processor is further configured to self-learn based upon the quality information associated with the quality of results of past location measurements.

Claim 22 recites a system, which includes providing means for providing quality information regarding quality of results of past measurements associated with location determination by at least two measurement devices. The system further includes storing means for storing said quality information and identity information associated with the at least two measurement devices. The system further includes selecting means for

providing selection information for selection of measurement devices for future location determinations based upon the stored quality and identity information. The selecting means includes self-learning means for self-learning based upon historical quality information associated with the measurement devices.

Claim 23 recites a system, which includes triggering means for triggering a location process, and obtaining means for obtaining selection information for selection of at least one measurement device, the selection information including information of measurement devices that have historically provided measurement information that satisfies a predefined criteria. The system further includes selecting means for selecting at least one measurement device, and locating means for locating user equipment based on measurement information from the selected at least one measurement device.

Claim 24 recites a system, which includes storing means for storing historical data of various measurements in a mobile system. The system further includes selecting means for selecting at least one measurement device based upon the historical data. The system further includes self-learning means for self-learning based upon historical data associated with measurement devices.

Claim 25, recites an apparatus, which includes processing means for processing quality information associated with quality of results of past location measurements by a plurality of measurement devices. The apparatus further includes means for providing selection information for selection of at least one measurement device for future location determinations based upon the quality information. The apparatus further includes means

for self-learning based upon the quality information associated with the quality of results of past location measurements.

Thus, embodiments of the invention provide for improved location performance and capacity. In embodiments of the invention where several measurement devices are available, history data can be utilized to select the most efficient measurement device or a measurement device with a lower load. Loading of the mobile system is reduced, and quality of the measurements is improved.

As will be discussed below, the combination of Larsson and Heinonen fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the advantages and features discussed above.

Larsson generally discloses an apparatus and method of selecting location measurement units for measuring an uplink signal transmitted by a mobile communication station operating in a wireless communication network in order to locate the position of the mobile communication station in the wireless communication network. The location measurement units to be used in measuring the uplink signal can be identified by evaluating one or more of relative positional relationships between the possible position of the mobile station and a plurality of further positions respectively associated with a plurality of location measurement units in the network, path loss measures predicted for each of a plurality of location measurement units relative to the possible position of the mobile station, and geometric dilution of precision (GDOP)

values determined for each of a plurality of groups of location measurement units with respect to the possible position of the mobile station. (see Larsson at Abstract).

Heinonen generally discloses a location method for mobile networks. A location estimate is determined based on a parameter set received from the mobile network. In order to improve the accuracy of the system, a matrix is formed for an individual first parameter set, the matrix including a plurality of elements, whereby each element is associated with a certain geographical area and contains a value which indicates the probability of the mobile being located within said area. At least one matrix formed for a mobile is stored, and in response to a second parameter set received for the mobile, the values of at least one matrix stores are updated, and the location estimate is determined on the basis of the element values of the matrix corresponding to the second parameter set and on the basis of the element values of the at least one matrix having the updated values. (see Heinonen at Abstract).

Applicants respectfully submit that Larsson and Heinonen, whether considered individually, or in combination, fail to disclose, teach, or suggest, all of the elements of the present claims. For example, the combination of Larsson and Heinonen fails to disclose, teach, or suggest, at least, "wherein the providing selection information comprises self-learning based upon historical quality information associated with the measurement devices," as recited in independent claim 1, and similarly recited in independent claims 7, 12, 16, 22, and 24-25; and "the selection information including information of measurement devices that have historically provided measurement

information that satisfies a predefined criteria," as recited in independent claim 6, and similarly recited in independent claim 23.

The Office Action correctly acknowledged that Larsson fails to disclose, teach, or suggest, "wherein the providing selection information comprises self-learning based upon historical quality information associated with the measurement devices," as recited in claim 1, and similarly recited in claims 7, 12, 16, 22, and 24-25; and "the selection information including information of measurement devices that have historically provided measurement information that satisfies a predefined criteria," as recited in claim 6, and similarly recited in claim 23. (see Office Action at pages 3 and 4).

Heinonen does not cure the deficiencies of Larsson, because, as will be discussed below, Heinonen fails to disclose, or suggest, self-learning, and historically provided measurement information that satisfies a predefined criteria.

Regarding claims 1, 7, 12, 16, 22, and 24-25, as described above, Heinonen discloses a location method and system for mobile networks. Specifically, Heinonen discloses that a mobile network provides a parameter set which includes cell-identifying data (e.g. the coordinates of a Base Transceiver Station), Timing Advance information (i.e. how far the mobile most likely is from the base station, using the minimum distance from the antenna (R_{min}), and the maximum distance from the antenna (R_{max})), an identifier for identifying a particular mobile, a time stamp indicating the moment of the location measurement, and the sector information. (see Heinonen at paragraph 0027).

The parameter sets available from the mobile network are processed in an accuracy server, which receives location requests from external objects. The accuracy server forms a matrix on the basis of the parameter set or retrieves a matrix corresponding to the parameter set from among a plurality of matrices formed in advance and stored in a matrix database. The accuracy server further uses mobile-specific history data stored in a history database. Specifically, a previous matrix obtained in connection with a preceding parameter set relating to the same mobile is also retrieved from the history database, and this matrix is supplied to an update process. As a result of the update process, a spread history matrix is obtained. (see Heinonen at paragraphs 0029, 0034).

The current matrix and the spread history matrix are then supplied to a combination process where a combined matrix of the same size is determined. At least one location estimate is then calculated on the basis of the combined matrix. Furthermore, the combined matrix is supplied to the history database, where it replaces the previous matrix. (see Heinonen at paragraph 0035).

Therefore, while the system of Heinonen uses historical data to create a matrix used to calculate a location estimate, Heinonen fails to disclose or suggest self-learning based on the historical data. The system of Heinonen fails to learn anything from the historical data that is used in the estimation process. (see Heinonen at paragraph 0032). Instead, the spread history matrix is merely combined with the current matrix determined by the system based on a set of predetermined rules.

In contrast, according to an embodiment of the present invention, a SMLC obtains the cell identity of a cell serving a mobile station when a request for location information is received, as well as obtaining a valid timing advance. The SMLC calculates a rough location estimate using the cell identity and the timing advance parameter, and then engages in an advanced location attempt, such as a U-TDOA. Thus, a <u>self-learning</u> process is disclosed, where the <u>SMLC is learning how the LMUs perform under certain criteria</u>. Once a sufficient amount of statistical data is collected, the SMLC uses the data to estimate which LMUs are most likely to perform useful measurements, i.e. the SMLC <u>learns</u> which LMU is most likely to perform a useful measurement. Once it is concluded that a sufficient amount of data is collected, a statistical analysis of the collected data is performed, and a LMU list is generated. Thus, due to the self-learning process, the SMLC now has a list of LMUs most likely to perform useful measurements. (see Specification at 0051-0056). As described above, this self-learning process is not disclosed or suggested in Heinonen.

Regarding claims 6 and 23, the Office Action parsed the "obtaining selection information" limitation into two components, and alleged that Larsson discloses the first component, whereas Heinonen discloses the second component. However, the manner in which the Office Action parsed the limitation, changed the meaning of the limitation, and improperly changed the scope of claims 6 and 23 beyond said claims' broadest reasonable interpretation consistent with the specification. This is improper under U.S. patent law, because during patent examination, a U.S. patent examiner must give pending

claims "their broadest reasonable interpretation consistent with the specification." *Phillips v. AWH Corp.*, 415 F.3d 1303, 75 USPQ2d 132 (Fed. Cir. 2005).

Specifically, treating claim 6 as a representative example, the Office Action parsed the limitation "obtaining selection information for selection of at least one measurement device, the selecting information including information of measurement devices that have historically provided measurement information <u>that satisfies a predefined criteria</u>," into the following components:

- "obtaining selection information including information of measurement devices <u>that satisfies a predefined criteria</u>" (first component); and
- "the selection information including information of measurement devices that have historically provided measurement information" (second component).

As shown above, the Office Action's parsing of the limitation moved the underlined phrase "that satisfies a predefined criteria" so that it modifies the phrase "information of measurement devices" rather than the phrase "historically provided measurement information." This parsing subtly changes the meaning of the limitation, as the parsed limitation no longer requires that the historically provided measurement information satisfy a predefined criteria. As discussed above, this is improper under the MPEP because the claim language, and the specification make clear that the historically provided measurement information is the information that must satisfy a predefined criteria.

Furthermore, neither Larsson, nor Heinonen, disclose, or suggest, "the selecting information including information of measurement devices that have historically provided measurement information that satisfies a predefined criteria." Larsson merely discloses that a mobile location center searches in its database for LMU's which are closest to the middle of the location area. (see Larsson at col. 4, lines 19-21). There is no disclosure or suggestion that the mobile location center searches for LMU's which have historically been closest to the middle of the location area. Moreover, Heinonen merely discloses that the system uses mobile-specific history data stored in a history data base, which comprise matrices obtained in connection with earlier received parameter sets. (see Heinonen at paragraph 0029). There is no disclosure, or suggestion, that the historical matrices must satisfy any predefined criteria whatsoever.

Therefore, for at least the reasons discussed above, the combination of Larsson and Heinonen fails to disclose, teach, or suggest, all of the elements of independent claims 1, 6-7, 12, 16, and 22-25. For the reasons stated above, Applicants respectfully request that this rejection be withdrawn.

Claims 3-5 depend upon independent claim 1. Claims 8-11 depend upon independent claim 7. Claims 13-15 depend upon independent claim 12. Claims 17-19 depend upon independent claim 16. Thus, Applicants respectfully submit that claims 3-5, 8-11, 13-15, and 17-19 should be allowed for at least their dependence upon independent claims 1, 7, 12, and 16, and for the specific elements recited therein.

The Office Action rejected claims 20 and 21 under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious over Nowak (U.S. Patent No. 6,968,195) ("Nowak") in view of Heinonen. The Office Action took the position that Nowak discloses all the elements of the claims with the exception of "the processor is further configured to self-learn based upon the quality information associated with the quality of results of past measurements," with respect to claim 20, and "self-learning based upon the quality information associated with the quality of results of past measurements," with respect to claim 21. The Office Action then cited Heinonen as allegedly curing the deficiencies of Nowak. The rejection is respectfully traversed for at least the following reasons.

Claim 21 recites a computer program comprising program code configured to perform a method when the program is run on a computer. The method includes providing quality information of results of past location measurements by a plurality of measurement devices of a first type. The method further includes obtaining selection information for selection of at least one of said plurality of measurement devices of a first type to use for future location determinations based upon the quality information. The method further includes self-learning based upon the quality information of the results of past location measurements by the measurement devices.

The advantages of embodiments of the invention, as discussed above, are incorporated herein.

As will be discussed below, the combination of Nowak and Heinonen fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the advantages and features discussed above.

The description of Heinonen, as discussed above, is incorporated herein. Nowak generally discloses a method and apparatus for managing the selection of location information sources to provide location information for a mobile communications unit. Embedded within a request for location information on a particular mobile communication unit are one or more specifications regarding the quality of the requested location information. Such specifications are used to determine if any location information sources are able to provide the location information with the desired location information quality. (see Nowak at Abstract).

Regarding claim 20, said claim has been amended to depend upon independent claim 16. As discussed above, Heinonen (as well as Larsson) does not disclose, teach, or suggest all of the elements of independent claim 16. Furthermore, Novak does not cure the deficiencies in Heinonen, as Novak also does not disclose, teach, or suggest, at least, "wherein the processor is further configured to self-learn based upon the quality information associated with the quality of results of past location measurements." Thus, the combination of Heinonen and Novak does not disclose, teach, or suggest all of the elements of claim 20. Additionally, claim 20 should be allowed for at least its dependence upon independent claim 16, and for the specific elements recited therein.

Regarding independent claim 21, Applicants respectfully submit that Nowak and Heinonen, whether considered individually or in combination, fail to disclose, teach, or suggest, all of the elements of independent claim 21. For example, the combination of Nowak and Heinonen fails to disclose, teach, or suggest, at least, "self-learning based upon the quality information of the results of past location measurements by the measurement devices," as recited in independent claim 21.

The Office Action correctly acknowledged that Novak fails to disclose, teach, or suggest, "self-learning based upon the quality information of the results of past location measurements by the measurement devices," as recited in independent claim 21." (see Office Action at page 8).

Heinonen does not cure the deficiencies of Nowak. While each claim of the present application has its own scope, Applicants respectfully submit that Heinonen fails to disclose, or suggest, "self-learning based upon the quality information of the results of past location measurements by the measurement devices," as recited in independent claim 21, for similar reasons as to why Heinonen fails to disclose, or suggest, "wherein the providing selection information comprises self-learning based upon historical quality information associated with the measurement devices," as recited in claim 1, as discussed above.

Therefore, for at least the reasons discussed above, the combination of Nowak and Heinonen fails to disclose, teach, or suggest, all of the elements of independent claim 21.

For the reasons stated above, Applicants respectfully request that this rejection be withdrawn.

For at least the reasons discussed above, Applicants respectfully submit that the cited prior art references fails to disclose or suggest all of the elements of the claimed invention. These distinctions are more than sufficient to render the claimed invention unanticipated and unobvious. It is therefore respectfully requested that all of claims 1 and 3-25 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

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